FAA | AVIATION NEWS

APRIL 1964

F E D E R A L A V I A T I O N A G E N C Y

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COVER

Sightseeing Sikorsky S-61N helicopter circles the Unisphere, symbol of the 1964-65 New York World's Fair which opens this month.

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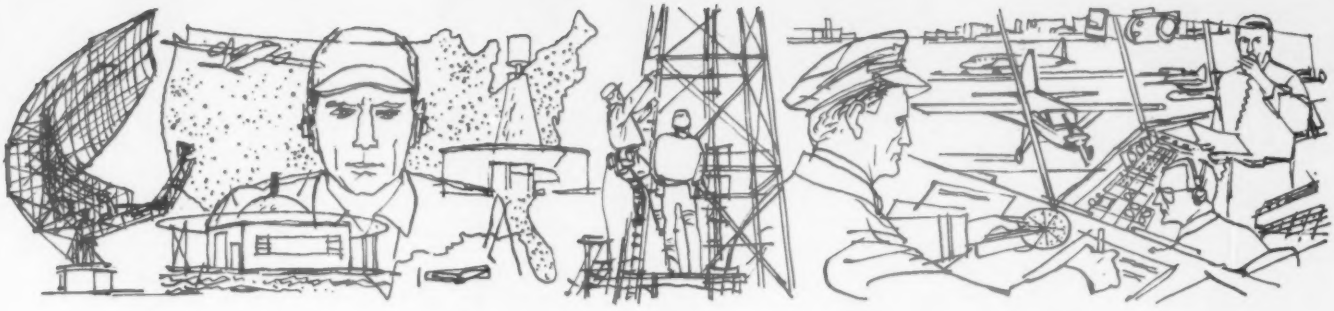


IMPACT HAZARDS STUDIED IN SCIENTIFICALLY CONTROLLED PLANE CRASH

A surplus Douglas DC-7 will be deliberately crashed into ground obstacles this month in the first of two Federal Aviation Agency research and development tests.

Designed to study the effects and hazards in typical landing and takeoff accidents, and to evaluate new seat designs, the crash test laboratory will be put through its paces at a specially constructed strip at Deer Valley Airport, 20 miles north of Phoenix, Ariz.

Under particular observation during the scientific tests will be fuel containment in the wing tanks under crash impacts, crash-load forces experienced on aircraft structural components and in the passenger cabin, and crash effects on typical equipment and dummy passengers in different parts of the cabin. The equipment will include different types of seats, configurations, galleys and cargo.

Extensive instrumentation on and in the transport will provide engineers with impact data. High-speed cameras located in the cabin and at various locations of the test site will make a photographic record.

Included in the tests are items supplied by such agencies as National Aeronautics and Space Administration, the Army, Navy and Air Force, the Society of Automotive Engineers and the Civil Aeronautics Board.

The test aircraft will accelerate under its own power down a 4,000-foot guided test strip reaching a speed of approximately 120 knots before impact *(see below)*.

The remotely controlled test aircraft will collide with barriers especially built at the test site to simulate an impact similar to one experienced in a crash landing.

Plowing through what is literally an obstacle course, the test transport's right wing will hit four telephone poles. Its left wing will hit an embankment. The fuselage will initially strike a sloping ramp that will provide an impact similar to a crash landing. It will then strike a steeper ramp, providing more severe crash conditions.

The special tests involved in this project are being conducted for the FAA by the Flight Safety Foundation, Inc., of New York under a $168,000 contract. Some of the specific studies being made during this test include:

■ **Fuel Tanks.** To study the effect of the impact on one cell of a fuel tank on each wing of the test aircraft which will be filled with a gelled fuel. Other tanks will be purged and filled with dyed water to simulate the fuel load. A special auxiliary fuel tank will be used to provide fuel for the engines during the crash test run.

■ **Passenger Seating Experiments.** Various two and three place seats, in both forward and rear facing arrangements, will be tested in different parts of the passenger cabin. Interior motion study cameras will record the effect of the impact on dummies and on artificial loads placed in the seats. An infant restraint system presently being used in commercial aircraft will also be tested.

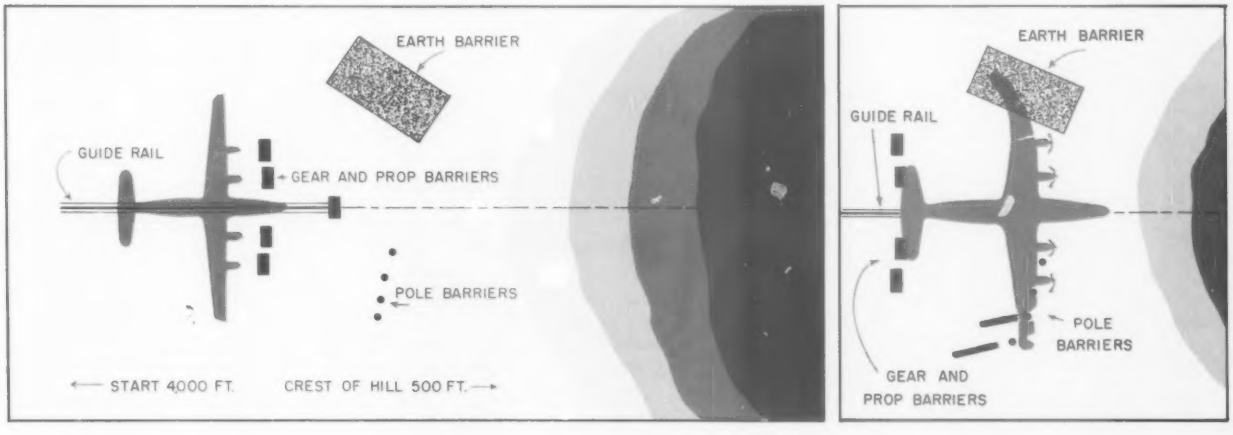
■ **Galley experiment.** The impact effect on the standard galley will also be studied.

■ **Cockpit Seating Experiment.** The Navy will provide three experimental crew seats and instrumentation for study of the crash dynamics involved in the cockpit area.

■ **Cargo Pallet Experiment.** The cargo experiment will study 5,000-pound crushable cargos with different types of restraint nets.

A second series of crash tests using a Lockheed 1649 Constellation tentatively has been set for the middle of June.

First impact tests will utilize DC-7. Shown here is a Super Constellation which will be used in similar test in June.



AIR TAXI AND COMMERCIAL SMALL AIRCRAFT OPERATORS RULES ISSUED

A new Federal Aviation Regulation which affects the nation's 3,000 air taxi operators will go into operation on September 7, 1964.

The regulation, the new Part 135 of the FAR, incorporates major revisions of certification and operation standards for air taxi operations. It also covers commercial operators of small aircraft (under 12,500 pounds).

Major provisions of the new rules not included in previous regulations governing air taxi operators or commercial operators of small aircraft are summarized below:

1—An instrument rating for the pilot and basic Instrument Flight Rules (IFR) instrumentation for the aircraft are required when passengers are carried in Visual Flight Rules (VFR) night operations and certain VFR "over-the-top" operations. Instrument capability is considered essential to the safe conduct of these operations because of the increased possibility of inadvertently encountering adverse weather conditions.

2—Limited IFR operations with passengers in single-engine airplanes are permitted provided certain conditions are met. These include a requirement for a "buffer" zone of VFR weather beneath the weather ceiling to permit an emergency descent or landing in case of unforeseen circumstances.

3—Use of an autopilot system in lieu of a second pilot for IFR operations is permitted subject to certain limitations needed for safety. Federal Aviation Agency flight tests have shown this equipment to be of considerable assistance to the pilot, giving him relief from actual flying while he tends to navigational planning, communications and other flight tasks.

The tests also showed that safe and efficient use of autopilots in small aircraft depends greatly on the pilots' familiarity with the equipment. Consequently each pilot/aircraft/autopilot combination must be individually demonstrated and approved by an FAA inspector before being used in air taxi IFR operations. This provision will enable the Agency to exercise careful and intimate control over autopilot use by those operators who are authorized to employ the equipment.

4—Limited IFR passenger operations without a second pilot or automatic pilot also are permitted under special conditions. For example, when marginal VFR conditions are encountered en route and reports and forecasts indicate the pilot will be able to return to VFR at least 15 miles before reaching the destination airport.

FAA believes that it is safer to permit limited IFR operations by a qualified pilot flying alone than it is for him to fly under minimum VFR conditions with the resulting potential hazard of collision with other aircraft, ground obstacles, or rising terrain.

In addition to these provisions, Part 135 establishes minimum certificate requirements for co-pilots and recent experience requirements for pilot-in-command of small multi-engine aircraft. It also establishes criteria for issuance of company check pilot authorization, updates oxygen requirements, and increases radio equipment requirements for IFR, VFR "over-the-top" and VFR night operations.

Part 135 is the product of numerous rule making efforts dating back to 1955. The last Notice of Proposed Rule Making on the subject (No. 62-48) was circulated for industry comment on November 8, 1962.

IDL BECOMES JFK AS NEW AIRPORT DESIGNATION GOES INTO EFFECT

It's **JFK** now.

Wherever you look, on baggage checks, weather sequences, approach charts or navigation charts, the airport indicator for New York's International Airport bears a new monogram—JFK.

Although the change was announced in January, following the renaming of the air terminal as John F. Kennedy International Airport, the effective date of the changeover was delayed until this month to allow an orderly, unified transition. The indicator IDL, which stood for New York International (Idlewild) Airport, will be retired from further use.

Changing the three letters from IDL to JFK actually represents a tremendous job requiring 60 to 90 days. Corrections had to be made in hundreds of aviation handbooks and manuals, weather sequence reports and charts, navaid maps and charts, airline timetables, baggage checks, airline forms, Post Office manuals, and numerous other forms and charts. Also a number of organizations and agencies using electronic data processing equipment had to reflect the change from IDL to JFK in their automatic systems.

Airport indicators vary from two to four letter symbols. The first navaids—the low frequency radio ranges—in the middle twenties were identified by two letter indicators. As airways and airline operations expanded after World War II, the indicators were increased to three letters. The letters have always been related to the locations they identify, although not always clearly. For example:

YIP—Detroit Willow Run Airport is located at Ypsilanti.

SDF—Louisville Standiford Field.

ORD—Chicago's O'Hare Field used to be Orchard Airport.

MBS—Saginaw, Mich., is a tri-city airport serving Midland, Bay City and Saginaw.

VLE—Grand Canyon, the airfield is at Valle, Ariz.

PPF—Coffeyville, Kansas, airlines use Parson Pep Field.

GGG—At Longview, Texas, there are three Gs in Gregg County Airport.

Four letters are used as international identifiers. The standard three letters which generally signify the airport location are preceded by one character that signifies the area of the globe in which the airport is located, rather than the country.

M signifies an area which includes Mexico and Central America. Mexico City Airport is indicated as MMMX and Guatemala City's La Aurora Airport is MGGT. Most of South America is indicated by an S. In Europe, an E indicates England, Norway, Sweden, Finland, Germany, and that part of the USSR eastward to longitude 45° East.

SHORTAGE OF AVIATION MECHANICS ANTICIPATED

A serious shortage of aircraft maintenance personnel faces the aviation industry, according to an FAA survey.

Based on returns from 28,288 certificated maintenance airmen who returned questionnaires—about one-fourth of those on FAA rolls—the report shows that more than half are in the 40 to 60 age group. Only three percent, or 935 mechanics, are between 18 and 24 years old.

The report also states that a considerable number of mechanics are being attracted by the missile and spacecraft industry.

"The survey gives definite evidence," FAA's Flight Standards Director George S. Moore, said. "that relatively few youngsters are being drawn to this career field. It would seem that both industry and government are going to be hard-pressed to satisfy immediate needs for mechanics and, particularly, to meet the critical and highly-specialized requirements that face us in the decade ahead, when the commerical supersonic transport will be with us."

The number of active certificated mechanics is estimated at approximately 80,000, with some 30,000 employed by the airlines, 44,000 by general aviation, and 6,000 by manufacturers and government.

The problem of anticipated shortages of aviation manpower for future requirements is of great concern to the Federal government and industry. About a month ago, FAA Administrator N. E. Halaby established a study board of officials representing industry, labor, education and aviation. They were asked to determine ways to assure the timely availability of necessary aviation skills five, ten and twenty years from now. Data collected from the maintenance airmen survey will be utilized by the study board in its analysis of ground support requirements.

Copies of the "Report of 1962 Survey of Maintenance Airmen" can be obtained by writing to the Flight Standards Service, Maintenance Division, Federal Aviation Agency, 800 Independence Ave., S.W., Washington, D. C.

British Conferees Visit Dulles

Meetings of American and British aviation experts in Washington recently included a visit to Dulles International Airport where the Right Honorable Julian Amery, British Minister of Aviation (second from left), *and his delegation toured the tower with FAA Administrator N. E. Halaby and Dulles tower chief, Walter Britton* (right). *During the 4-day conference, the officials discussed North Atlantic air traffic, SST development and noise suppression.*

Announce Plans of 2nd Annual Aviation Mechanic Safety Award

The second annual Aviation Mechanic Safety Awards Program is being launched this month to select the outstanding aviation mechanics of 1964.

Mechanics will be honored by the Federal Aviation Agency for making significant contributions to air safety. These may be improvements to aircraft, powerplants, their components or in maintenance procedures.

Separate awards will be made in general aviation and air carrier categories at both the national and FAA regional levels. In addition, general aviation entrants will be eligible for awards in each of the fifty states, Puerto Rico and Virgin Islands.

All aviation mechanics who are United States citizens are eligible to enter provided they are actively working in maintenance, overhaul or inspection of aircraft, powerplants or accessories. Every eligible aviation mechanic may submit his own entry form this year. He does not have to be nominated by his supervisor, as was the case last year. However, any person having knowledge of another mechanic's work may enter him.

Complete details and entry forms (Advisory Circular AC 60-2A) are being distributed now by the various aviation trade associations and FAA maintenance inspectors. Additional information is available at FAA air carrier and general aviation district offices.

NOTAMS Handling Now Limited To Essential Operational Items

FAA began streamlining the handling of NOTAMS last month in an effort to improve dissemination of essential flight information.

Henceforth, NOTAMS will be issued only on items which have direct operational significance such as inoperative navigation aids, unscheduled airport or runway closings, or new or rescheduled IFR procedures.

Other time critical items will be classified as Airmen Advisories and normally disseminated only in the area of immediate concern during preflight or in-flight briefings or during other pilot contacts. These advisories will cover items which do not directly affect flight safety but which will be of significant interest to pilots. Examples of advisory items include fuel jettisoning, ramp and taxiway defects, birds/animals on landing field, and men/equipment on landing field.

PREDICT BOOST IN GENERAL AVIATION AIRCRAFT

A sizeable increase in the number of general aviation aircraft in the next five years is forecast by FAA planners.

During this period, the general aviation fleet is expected to soar to 102,000, an increase of more than 20 per cent over 1963. As of January 1, 1963, the general aviation fleet totaled 84,121 aircraft.

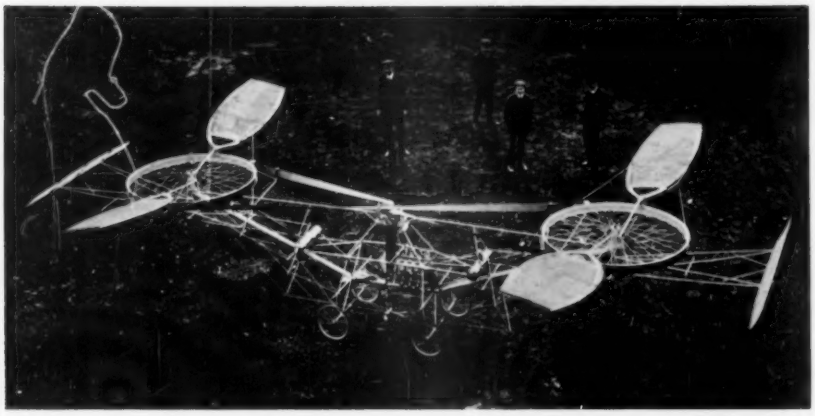
Business flying, which already accounts for more than 40 per cent of all general aviation activity, is expected to provide the major impetus for the growth.

Figures indicate that the largest increase will be in multi-engine type aircraft. The forecast indicates an increase from 9,186 multi-engine aircraft in 1963 to a new high of 13,200 in 1969. The number of single-engine 4-place and larger aircraft will increase from 41,120 to 57,000.

On a percentage basis, turbine-powered aircraft and rotorcraft are expected to make their greatest inroads during this five-year period. Turbine-powered aircraft are expected to increase from 213 in 1963 to 850 in 1969, and rotorcraft from 967 to 1,850.

Along with the increases in the total aircraft population, annual aircraft production is expected to increase gradually from 8,392 in 1963 to a high of 10,000 in 1969. This figure, however, is dependent on the corporate and business flying market which fluctuates with business activity.

MILESTONES IN AVIATION



ONE of the world's first successful manned helicopter free flights is generally credited to a Frenchman, Paul Cornu. On November 13, 1907, near Lisieux, France, he took off and ascended to an altitude of about one foot. On later flights, he managed a height of five feet and was timed at six miles per hour in forward flight.

Cornu's helicopter *(above)* was a compact two-rotor machine. It was powered with a 24-horsepower Antoinette engine which was practically set in the pilot's lap. The pilot sat atop the landing gear, which was composed of four bicycle wheels.

The helicopter had a length of 40 feet 4 inches and blades 5 feet 11 inches. Its framework was welded steel tubing.

Paul Cornu gave up his helicopter experiments in 1909 because he lacked money to continue his experiments. Although his helicopter had not been as successful as he had anticipated, Cornu did prove that vertical manned flight was possible.

Cornu's manned flight was preceded by the Breguet Brothers who made the first takeoff with a man aboard their helicopter on September 29, 1907, at Douai. But it was not a free flight. Four men held ground support poles, one under each of the four rotors, and although not helping to lift the machine, aided its stability in the air.

Despite these early helicopter flights, the first practical helicopters did not appear until the 1930's. *(USAF Photo)*

FAA-Industry Plan Meeting on Rotorcraft Safety Regulations

Rotorcraft safety regulations will be discussed at an FAA Flight Standards conference scheduled to meet in Washington, D. C., in early June.

The conference agenda is being prepared by FAA from comments and suggestions received from interested persons and from material developed by the Agency. As soon as the agenda is completed, it will be distributed to the public in advance of the conference to permit adequate preparation by all interested participants.

Some of the general areas of discussion to be covered at the conference are:

Rotorcraft design and manufacture. Flight loads, fatigue, emergency evacuation, emergency water landing, cargo and baggage compartment, autorotation, powerplant installation and rating requirements, and performance limitations.

Rotorcraft operations. General review of Part 46 including landing site, crew training and flight crew experience, external loads operations and other operations for compensation or hire.

Airman certification. Instrument rating and experience requirements.

Also included will be maintenance and air traffic rules, instrument approach procedures and minimum altitudes, and other matters of current interest.

Copy of Regulations Affecting Sports Parachutists Available

Rules and regulations pertaining to sport parachuting have been printed for free distribution by FAA as an aid to parachutists and their pilots.

In outlining their responsibilities under the *Federal Aviation Regulations*, emphasis has been given to those regulatory areas which have been a particular problem to jumpers and jumping clubs.

The new guide lists the various types of jumps which require prior FAA authorization under Part 105 of the *Federal Aviation Regulations* and describes the notification procedures. Also summarized are the clearance-from-clouds requirements and visibility minimums that affect safe conduct of sport jumps.

In addition, information is provided on parachute standards and the rules governing the manufacture, alteration, repair and packing of this equipment.

The guide, Advisory Circular AC 105-1, may be obtained free by writing to HQ-436, Federal Aviation Agency, Washington, D. C. 20553.

MAJOR PROGRAM LAUNCHED TO IMPROVE AVIATION MECHANIC TRAINING

Six FAA-certificated aviation mechanic training schools are participating in a trial study program designed to modernize and improve the training of future aviation mechanics.

The program begins this month at three schools, Spartan School of Aeronautics, Tulsa, Okla.; Pittsburgh Institute of Aeronautics, Pittsburgh, Pa.; and Northrop Institute of Technology, Inglewood, Calif. Spartan will offer a powerplant course, and PIA and Northrop will offer a combined airframe and powerplant course.

In September, three other schools will enter the program. Long Beach City College, Long Beach, Calif., will offer a combined A&P course, Chicago's Dunbar Vocational High School will offer a powerplant course, and Chicago Vocational High School will offer an airframe course.

For the test program, the six schools have agreed to develop a new curriculum, a testing program, and a record system which will prepare the student for certification as an aviation mechanic. The project will be under the continuous supervision of the FAA Flight Standards Service, Maintenance Division.

The objective of the study program is to develop a system which would allow the FAA to further recognize the instruction offered by a certificated mechanic school and accept the training of a successful graduate as meeting the experience, knowledge and skill requirements of part 65 of the *Federal Aviation Regulations* pertaining to certification of aviation mechanics.

All students participating in the FAA study program will be recommended to the FAA for certification by the school upon completion of the course and after successfully passing a comprehensive written, oral and practical final examination given by the school under the direct supervision of the FAA.

Evaluation is expected in mid-1965.

PROPOSE CHANGEOVER POINTS FOR NEW AIRWAYS

The FAA has under consideration a rule that would prescribe points between airway navigation facilities where a pilot flying on airways, direct routes or jet routes should change radio frequencies from the facility last passed to the next one coming up.

Use of the changeover points would be required under the new two-layer airway structure which FAA expects to announce shortly in a Notice of Proposed Rule-making. This proposed rule would eliminate the present intermediate layer of airways between 14,500 and 24,000 feet. As a result, there will be established a layer of low airways up to 18,000 feet and a high level structure from 18,000 feet up to 45,000.

The proposed rule includes a new formula for determining the lateral extent of the airways based on changeover points. This formula also would be used to determine the width of controlled airspace associated with jet routes outside the continental control area. At present, the continental control area begins at 14,500 feet and applies only to the airspace over the 48 contiguous states.

The proposal regarding changeover points is identified as Notice 64-11, Regulatory Docket No. 4023.

Changeover points would be designated for all Federal airways and jet routes in Part 95 of the *Federal Aviation Regulations*. They would not be listed for each airway and route segment, however. Normally, the changeover points would be midway between the navigational facilities for a straight route segment. For a dogleg segment it would always be at the intersection of the radials forming the dogleg. Changeover points, therefore, would be listed only for those segments where there is a deviation from the normal method of designation. Changeover points would also be designated in Part 95 for direct routes. The deviations, however, would only cover points approved for air carriers.

There is no provision in the notice for changeover points for intermediate altitude VOR airways since these airways will be eliminated, as stated previously.

Comments on the proposed rule may be sent to the Federal Aviation Agency, Office of the General Counsel, Attention Rules Docket, Washington, D. C. 20553. Deadline for comment is April 20.

Canny Duster Becomes Aerial Salt Shaker to Fill Winter Void

An enterprising aerial applicator who spent the winter successfully spreading salt on icy western Michigan highways is ready to return to his regular routine—crop dusting the back forty.

Robert Mueller, owner of a crop dusting company in South Haven, Mich., turned his normally seasonal business into a year 'round operation when he convinced the County Road Commission to try his aerial salting experiment.

The test was so successful that the idea was included in the County's budget and during the past winter Mueller and his five pilots have been spreading salt on the highways.

The "road dusters" used single-engine Piper Cubs to spread a 20-foot wide path of salt on the highway with great accuracy. The planes were flown at 90 mph about 50 feet over highway intersections, railroad crossings, grade separations and other areas being salted.

The salt "fallout," similar to a light sleet, presents no hazard to cars or pedestrians. However, when salting roads while cars are operating, the pilots make their spraying runs in the same direction as the traffic to minimize the psychological shock on the motorists.

President Approves Three-Year Airport Aid Bill

President Johnson has signed into law a bill to continue the Federal Aid-Airport Program for three years. The measure also authorizes $225,000,000 or $75,000,000 annually, to help finance the various airport projects.

The President paid tribute to FAA Administrator Halaby "for the outstanding leadership that he has provided this Nation in aviation. . . ."

Under the FAAP, the Federal Government generally pays up to 50 per cent of the cost of airport improvement projects. Among the projects that can be financed under the aid program are the acquisition of land for airport purposes, repaving runways and taxiways, and the installation of landing and navigational facilities. Federal funds cannot be used for terminal or parking areas.

Proper planning is the start of the navigation process.

AERIAL N

An all-too familiar situation concerns the pilot who gets disoriented, is not quite sure of his whereabouts or is just plain lost. At a minimum, this plight leads to frustration; at worst, it can be disastrous. We hope that this new series of articles, of which this is the first, will serve as a refresher course for those pilots who have become rusty in the fundamentals of navigation.

Aerial navigation is the science which deals with the methods used to direct an aircraft in flight from one place to another, to determine its position en route and to predict accurately its time of arrival at any specific point on the route.

But to pilots who have neglected to learn the fundamentals, it means diving down to tree level to read the name of a village on a water tower.

The pilot who relies on water towers to pinpoint his direction on cross-country flights is reminiscent of sailors in the days before the invention of the compass. In that era, mariners would sail only within sight of land. Or they would steer for short distances out of sight of land if the sun or stars, particularly the polar star, were available for reference.

Discovery of the loadstone and the subsequent invention of the compass in the 12th or 13th century gave mariners the tool they needed to venture away from the shores in search of the New World and riches.

Great strides to improve navigation methods were made in the 15th century when Prince Henry the Navigator of Portugal set up his Geographical School. This beginning laid the groundwork for such explorer-navigators as Ferdinand Magellan, whose ship was first to go around the globe.

Further advances in navigation were scored with the discovery that astronomy could be used to determine latitude. The invention of the chronometer in the 18th century enabled navigators to determine longitude by a comparatively simple calculation.

Today, a pilot can benefit by the ground work laid by these pioneers. By using basic methods developed centuries ago and adding modern day navigation methods, a pilot is capable of navigating anywhere on the globe with great precision.

This ability to navigate precisely is based on the ability to solve three major problems in flight. A pilot must be able to determine:

- The position of the plane at any time.
- The time the airplane will reach any position.
- The airplane heading needed to reach any desired destination.

To determine these, a pilot can use four different types of navigation:

- Pilotage
- Dead reckoning.
- Radio navigation
- Celestial navigation

The first two types of navigation are the fundamental methods available for VFR pilots. An understanding of the other forms, however, will aid the pilot.

Pilotage is the basic form of navigation for the inexperienced and should be mastered first. By using visible landmarks as a reference, a pilot can navigate over land areas in good weather with comparative ease. But if poor visibility or bad weather develops, a pilot needs additional aids such as dead reckoning, radio navigation or other methods.

Dead reckoning depends on a pilot computing his direction and distance from a known position to keep track of his location.

Radio navigation depends on radio aids to determine position.

Celestial navigation refers to the use of the sun, moon, and other celestial bodies to determine position. (Normally, this is beyond the scope of the general aviation pilot and consequently it will be mentioned only briefly in this series of navigation.)

A variety of tools are available to the pilot who seeks clear

Left: Selecting the safest, most direct route, the pilot draws his course and, *below*, checks weather for good winds.

The *Airman's Guide* lists hazardous conditions that might affect safety of flight.

Pre-flight planning completed, the pilot is ready to take off for his destination.

VIGATION

vistas on his flights around the country.

Like the Sunday driver, a pilot has thousands of miles of "highways" available to him in the form of Federal Airways. These electronic aerial highways criss-cross the entire United States and connect all the principal cities. Although a pilot is not required to follow the airways, he frequently will find them convenient because they are equipped with various aids and have been established for his convenience and safety.

Radio navigation aids, which are located along the airways, are appropriately spaced to provide both navigational guidance and air-ground communications facilities. Weather reporting service also is available to the pilot through twice-hourly weather broadcasts or by request. In addition, lights and intermediate landing fields are located at many points along the airways. Also, the FAA operates many additional facilities to assist the pilots along the airways, such as flight service stations, air route traffic control centers, control towers, radar facilities, and instrument approach and landing systems.

Besides the aids en route, aeronautical charts published by the U.S. Coast and Geodetic Survey for all areas of the United States are available.

Charts which would be of prime interest and use to the private pilot are:

Local Aeronautical Charts Scale on this chart is about 4 statute (3½ nautical) miles to an inch. These charts, drawn on a large scale, show more topographic detail than any other type of aeronautical chart. They are designed for use on VFR flights in highly congested areas. They are identified by the names of cities (*e.g.* Kansas City Local), and are priced at 25 cents each. There are 21 local charts in the continental U.S., and one for Honolulu and San Juan, Puerto Rico.

Sectional Aeronautical Charts Scale on this chart is about 8 statute (7 nautical) miles to an inch. They are in fairly complete detail. Intended primarily for use in pilotage, these charts are most widely used by private pilots. These charts (87 sheets—25 cents each) are identified by the names of principal cities or geographical features, such as Phoenix Sectional. An additional chart covers the Hawaiian Islands.

World Aeronautical Charts (WAC charts) Scale is about 16 statute (14 nautical) miles to an inch. Because these charts omit many topographical details, inexperienced pilots will encounter difficulty in their use when navigating by pilotage. They are designed for experienced pilots flying relatively fast planes on long trips. There are 62 sheets which cover the continental U.S. and are identified by name and number (*e.g.* WAC 310 Hudson River). They sell for 25 cents each. World coverage also is provided.

Aeronautical Planning Chart Scale is about 80 Statute (70 nautical) miles to an inch. This chart is designed for planning long flights and selecting key points which may be transferred to larger scale charts for actual flight use. The price of the AP chart of the United States (1 sheet, AP-9) is 40 cents.

Pilots using these charts should watch for obsolete ones. It is vitally important that pilots check the publication date of each aeronautical chart to be used on any flight. Obsolete maps should be discarded and replaced by new editions which are ordinarily published every six months.

Because it is impossible to issue editions of charts more frequently, recent changes are noted in the *Airman's Guide* which is published by the FAA every two weeks or by an Airmen Advisory. It lists changes in airport and navigational facilities which affect the safety of air navigation.

Aeronautical charts may be obtained at most airports from dealers in aviation supplies, or by writing the Director, U.S. Coast and Geodetic Survey, Washington, D. C. 20230, enclosing a check or money order. The *Airman's Guide* may be ordered from the Government Printing Office. An annual subscription is $7.00 domestic and $3.50 additional for foreign mailing.

WIDE VARIETY OF EDUCATIONAL PUBLICATIONS AVAILABLE TO AIRMEN

Many publications of special interest to airmen are available for purchase from the Government Printing Office (GPO) and others are available free of charge from the Federal Aviation Agency (FAA).

While this is only a partial list of pamphlets available, a complete list of publications can be obtained by writing the FAA, Attention: HQ-630, Washington, D. C. 20553.

Some of the aviation publications available are:

Examination Guides

Examination guides are helpful to applicants preparing to take examinations for various ratings. They contain information about requirements, applications and examinations and they list recommended study material and study outlines. Guides available are:

Airline Transport Pilot (Airplane) Examination Guide. 1962. (35¢ GPO)

Airline Transport Pilot (Helicopter) Written Examination Guide. 1962. (30¢ GPO)

Airplane Flight Instructor Examination Guide. 1962. (40¢ GPO)

Commercial Pilot Examination Guide. 1962. (65¢ GPO)

Instrument Flight Instructor Examination Guide. March 1962. (35¢ GPO)

Airframe and Powerplant Mechanics Examination Guide. Revised 1963. (30¢ GPO)

Ground Instructor Instrument Written Examination Guide. 1962. (25¢ GPO)

Ground Instructor Examination Guide, Basic-Advanced. 1963. (45¢ GPO)

Flight Test Guides

This is a series of study guides issued by the FAA which will assist the applicant in preparing for flight tests:

Multiengine Airplane Class or Type Rating. (15¢ GPO)

Private Pilot—Airplane, Single-Engine. (15¢ GPO)

Commercial Pilot—Airplane, Single-Engine. (15¢ GPO)

Instrument Pilot — Airplane. (15¢ GPO)

Helicopter—Private and Commercial Pilot. (15¢ GPO)

Gyroplane—Private Pilot. (15¢ GPO)

Gyroplane—Commercial Pilot. (15¢ GPO)

Glider—Private and Commercial Pilot. (15¢ GPO)

Training Manuals

All Weather Flight Manual. 1957. ($3.50 GPO) Revised 1961 pages ($1.75 GPO)

This manual is an excellent reference dealing with instrument flying and advanced pilot training. It is recommended as study material for those preparing for instrument pilot, airline transport pilot, instrument flight instructor and other FAA certificates and ratings of a similar nature.

Facts of Flight. Revised May 1963. (50¢ GPO)

In non-technical language, this booklet explains why an airplane flies, effects of the controls, stalls and spins, facts about airplane structure and engine operations, and proper technique in takeoff, cruising and landing.

Path of Flight. 1963. (70¢ GPO)

Contains practical information about navigation, radio communication, radio aids and flight planning.

Pilots Radio Handbook. 1962. (75¢ GPO)

Explains the purpose and use of flight assistance devices; describes the U. S. common system of air navigation and traffic control procedures; and discusses radio use, weather reporting and other aids to navigation.

Plane Sense. General Aviation Information. August 1962. (Free FAA)

Acquaints the prospective pilot and airplane owner with some of the fundamentals of owning and operating an airplane.

Private Pilot (Airplane) Flight Training Guide. 1963. ($1.00 GPO)

This guide is helpful to instructors who do not operate under a curriculum offered by a certified flying school. It will assist flight instructors planning the flight training of primary students.

Private Pilots Handbook of Aeronautical Knowledge. ($2.50 GPO)

An excellent reference for all private pilots. It contains essential, authoritative information used in training and guiding private pilots. All subject areas in which an applicant may be tested are covered in this handbook.

Realm of Flight. Revised 1963. (75¢ GPO)

A condensed elementary test on weather characteristics written for the private pilot.

Rules of Flight. September 1962. (55¢ GPO)

Requirements for pilot certification and ratings, rules of the air, air traffic control, aircraft registration, airworthiness, maintenance and inspection are described in this booklet.

Aircraft Powerplant Handbook. ($1.50 GPO)

Useful pamphlet for students, mechanics, pilots and engineers with a superficial knowledge of aircraft powerplant who want to increase their knowledge on the subject.

Flight Information

Airman's Guide. (Periodical). $7.00 domestic; $10.50 foreign (GPO)

Published every two weeks, the guide contains Radar-Radio Listings, NOTAMS, and Special Notices. Once every quarter, the *Directory of Airports and Seaplane Bases* is included as a separate Supplement.

Alaska Airman's Guide and Chart Supplement. (Free FAA)

Flight Information Manual. Volume 14, October 1962. ($3.75 domestic; $4.75 foreign GPO)

The Manual supplements the *Airman's Guide.* The subscription consists of the basic loose-leaf Manual and amendments for an indefinite period. A Pacific Supplement is available for those who have a need for information about the region and may be obtained free of charge from Pacific Region, FAA, P.O. Box 4009, Honolulu 12, Hawaii.

International Flight Information Manual. Volume 11, April 15, 1963. ($1.00 GPO)

Helpful to pilots planning foreign flights. Annual subscription consists of basic manual with supplements issued quarterly.

International NOTAMS. (Annual subscription: $3.00 domestic; $5.00 foreign GPO)

Supplements the *International Flight Information Manual,* providing weekly Notice-to-Airman services on a worldwide basis.

FAA Aviation News (Annual subscription: $1.50 domestic; $2.00 foreign, single copies 15¢ each GPO)

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Gordon M. Bain, Deputy Administrator for SST Development, chairs working session of SST design evaluators.

Volumes of designs.

SUPERSONIC TRANSPORT EVALUATION NEARS COMPLETION

Since competitive supersonic transport design proposals were submitted on January 15, 210 top government aviation experts have been dissecting, studying, analyzing, evaluating them in their multiple technical and economic aspects. Here, evaluators work to meet the deadline at the end of this month for completion of the complex process.

Results of this work, conducted by ten airlines in addition to the government group, are due by May 1. Airframe proposals being evaluated were submitted by Boeing, Lockheed and North American; engine proposals by Curtiss-Wright, General Electric and Pratt and Whitney.

The government evaluation group was drawn from four civilian agencies, two military services.

As evaluation nears conclusion, the total of SST reserved delivery positions reached 75. Ten foreign flag, four U. S. flag carriers have requested these deliveries.

Another element of SST program, study of public acceptability of sonic boom at levels predicted for plane's operations, enters its third month in Oklahoma City area.

Comprehensive analysis, evaluation of airframe and engine design proposals nears completion by government experts and, independently, by airlines.

GROUNDED FOR POSTERITY

Most of the Nation's aviation treasures are under lock and key in an aeronautical attic far from the eyes of the public.

These mementoes of the powered flight era are tucked away at the Smithsonian Institution's National Air Museum Preservation and Restoration Facility seven miles southeast of Washington, D. C.

Here, more than 180 airplanes of all vintages are stored in crates or disassembled into component parts for easy storage until the day adequate exhibit space is available at the National Air Museum.

Prototypes representing the dreams and realizations of aviation pioneers, from the early days of flight to modern day jet travel, make up the collection.

Among the aircraft stored in crates and under cover in 13 hangars are such old timers as the Bleriot XI monoplane, a 1912 Benoist biplane, a Nieuport 12, a SPAD 13 and an Albatros D-V.

Dispersed amidst the trees at the 23-acre site are many aeronautical veterans of World War II. These include the largest single collection, which was given to the Museum by the Air Force following the war. The Air Force aircraft collection includes: a P-47 *Thunderbolt*, P-38 *Lightning*, P-39 *Aircobra*, P-61 *Black Widow*, B-26 *Marauder* and B-17 *Flying Fortress*.

The Navy also sent a large number of its World War II aircraft for safekeeping. These include: the F4F *Wildcat*, F6F *Hellcat*, F8F *Bearcat*, F4U *Corsair*, SB2C *Helldiver*, TBF *Avenger* and many others.

Franklin D. Roosevelt's DC-4, the *Sacred Cow*, also is included in the Museum's historical collection.

Besides U.S. aircraft, many foreign aircraft—British, French, German, Italian, Japanese and others are to be found in this aircraft repository. A number of enemy aircraft captured during World War II and used for technical evaluation, such as the Japanese Zero and the German Me-262 jet, have also been turned over to the Air Museum.

One of the largest aircraft in the collection is a B-29 *Superfortress*, the *Enola Gay*, which dropped the first atomic bomb on Hiroshima. Because of its size, it is stored in more than a dozen sections.

At the hub of this large storage facility is a complete aircraft factory where the museum performs the major parts of its job of restoring and preserving these priceless relics.

A staff of eight full time aircraft technicians headed by Walter Male spends countless hours restoring the aircraft collection. Depending on the amount of specialized work required to restore each plane to its original condition, the tedious hand craftmanship has taken from two to three years in several instances.

Two airplanes now on exhibit at the Air Museum, the Wright Brothers' *Vin Fiz* which was first flown from coast-to-coast in 1911 by pilot Calbraith P. Rodgers, and Wiley Post's *Winnie Mae*, a Lockheed Vega which flew around the world in eight days, fifteen hours and fifty-one minutes in 1931, were restored at the facility.

Currently, four airplanes are being restored for future exhibit. They include:

- **The Fokker T-2.** It flew the first non-stop trans-continental flight from Roosevelt Field, Long Island, N. Y., to Rockwell Field, San Diego, Calif, on May 2-3, 1923. The single-engine, monoplane was piloted by Lieutenants John A. Macready and Oakley G. Kelly on a flight that lasted almost 27 hours.
- **The NC-4.** This Curtiss flying boat flew the Atlantic in 1919 with Lieutenant Commander Albert C. Read at the controls. It reached Lisbon on May 27 after hops from Newfoundland and the Azores.
- **The Loening OA-1A** amphibian. It was the flagship of the first South American flight flown by the U.S. Air Service in 1926-27.
- **The Northrup Gamma,** called the *Polar Star*. This single-engine, low-wing airplane was used by Lincoln Ellsworth, the American Polar explorer, on a 2,300-mile flight in November, 1935, over the Antarctic.

While the restoration work continues, most of the other aircraft will continue to gather dust until a new National Air Museum is built and more exhibit space is available.

Opposite Page: Mothballed U.S. and German aircraft in storage awaiting restoration. Top left and clockwise: Small aircraft plant where historically significant airplanes are restored; the Northrup *Gamma* which was flown by Lincoln Ellsworth on his flight over the Antarctic is one of the planes being restored; the bulky 400 h.p. Liberty engine of the Fokker is reworked; its restoration is checked with Louis Casey of National Air Museum; restored *Winnie Mae* which was flown around the world by Wiley Post in 1931 is exhibited at Air Museum; an awed youth admires the Wright Brothers' 1911 *Vin Fiz* which was flown coast-to-coast in 1911.

SAFETY FIRST

Spring Maintenance

Spring is fix-up time.

And after a long, hard winter, certain precautions should be taken before cranking up the airplane for a flight around the budding countryside.

To make a proper assessment of his aircraft, a pilot should apply lots of elbow grease and water and give his airplane a thorough cleaning. A clean surface will readily reveal any worn parts, tears of the fuselage fabric, or any other weak points of the aircraft.

Then, an extensive inspection, similar to a 100-hour inspection, should be performed to see that the airplane is airworthy after months of winter storage or inactivity.

This inspection usually includes:

- Oil change. Check for contamination which may have resulted from condensation during long periods of storage.
- Drain fuel pumps and strainers.
- Check carburetor strainer and bowl for sediment and water.
- Replace any worn parts or bolts.
- Replenish hydraulic reservoirs.
- Check for oil and fuel leaks.
- Check oil coolers. Look for debris, nests and rocks in intake scoop.
- Check fuel tank vents. Free them of mud, insect excretions, nests and other obstructions.
- Check pitot tube. See that no mud, dirt or obstruction clogs up the static system.
- Check wings. Look for "hangar rash" or other damage.

If deficiencies are discovered during the inspection, the pilot should refer these matters to a certificated aviation mechanic for correction.

During the inspection, the fuselage should be checked inside and out. Look for corrosion and other damage.

Rodents do extensive damage to airplanes at small fields. Rats have been known to chew off electrical cable insulation and rib stitching of fabric-covered aircraft and their excretions have caused serious structural damage. And like birds, rodents build nests between wings, cylinders of the engine and in the exhaust manifold stacks when planes have been hangared for long periods of time.

Lumps of dried mud which form on the fuselage and tend to absorb moisture and lead to corrosion, rot and decay should be removed before extensive damage results. Cuts, scrapes, dents and sensitive spots sometimes called "hangar rash," caused by the careless moving of aircraft in storage, should be corrected by a qualified aviation mechanic.

The coming of spring also presents operational problems. Icing is still a danger. In particular, carburetor icing, which does not depend on freezing temperatures, is most likely to occur between 40 and 60 degrees, and occasionally up to 90 degrees. Pilots should refer to aircraft manuals for detailed information regarding this phenomenon.

Spring rains may bring spring flowers but they also bring problems to pilots flying from sod air strips. The rains turn them into soft, bog-like fields. On takeoffs, mud collects and tends to freeze at higher altitudes, causing retractable landing gear to stick in the up position. Mud also can build up inside the wheel pants and unbalance or jam wheels on landing. A pilot should actuate the gear a few times after taking off from a sloppy field to shake loose any mud and moisture which might have been picked up.

Other suggestions for safe warm weather operation are:

- Remove winter shields on engine cooling openings, otherwise the engine can become dangerously overheated.
- Check idle RPM and reset for spring operations. Engines will idle faster in warm weather than in the winter.
- Drain fuel tanks completely to eliminate moisture and foreign material. To prevent condensation, keep tanks full when not flying.
- If aircraft has diaphragm fuel pump, check to make sure it has not dried out during storage. Pump will not function properly if this condition exists.
- Be sure brakes are operating properly. Mud in discs or linings can jam or grind the brakes.

Letters

FAA

FAA Aviation News welcomes comments from the aviation community. We will reserve this page for an exchange of views. No anonymous letters will be used, but names will be withheld on request.

● Instrument Flight Instruction

Several flight instructors in this area have an interpretation of Section 61.35 (c) of *Federal Aviation Regulations* which I believe to be incorrect.

They believe the phrase "and at least 10 hours were instrument flight instruction given by a person holding a flight instructor certificate with an instrument rating" allows the CFI-Airplanes to give this if he has an instrument rating on his private or commerical certificate. I do not believe this is the intent of the regulation.

B. H. Johnson
Memphis

This section of the Federal Aviation Regulations *prescribes, in part, that an applicant for an instrument rating shall have at least 10 hours of instrument flight instruction conducted by the holder of "a flight instructor certificate with an instrument rating." The regulations no longer authorize the conduct of instrument flight intsruction by a person who has an instrument rating on his pilot certificate, as was formerly the case.*

● Exchange Instructor Certificates

I understand that the regulation has changed regarding Limited Flight Instructor ratings. I have been out of the country nearly two years and will not return until after the expiration date of my rating. Is there any way that I can apply for extension or retention of my rating?

Captain Arthur Farrell
APO 16
New York, N. Y.

If you will fill out FAA application Form 342, and mail it together with your Limited Flight Instructor Certificate to the Federal Aviation Agency, General Aviation District Office, Teterboro Air Terminal, Teterboro, N. J., it will be exchanged for a Flight Instructor Certificate with appropriate ratings. Such exchange is provided for in Federal Aviation Regulation, *Part 61, subparagraph 61.9.*

● Kudos

I feel obliged to write this letter to let you know my reactions after visiting your FAA office in Albuquerque for a check ride. I had the pleasure of receiving most courteous and kind attention from the FAA personnel. In particular, I would like to commend Mr. Frank W. Cazier who gave me my check ride. He put me at ease immediately, which accounted, I am sure, for the success of the check ride. The ride was very thorough and because of this I have more knowledge than ever in my strong as well as weak points.

Rev. John Ahearn
Aragon, N. M.

● Taxiing Aircraft

Student pilots are prohibited from carrying passengers. There are instances when it would be a real convenience for a student pilot to taxi with a passenger aboard. Are student pilots prohibited from taxiing a plane with a passenger aboard?

Donald K. McEachern, Jr.
Birmingham, Mich.

Federal Aviation Regulations *(Section 61.73 of Part 61 (New) provides that a student pilot may not act as pilot in command of an aircraft that is carrying a passenger. As defined, a "pilot in command" means the pilot responsible for the operation and safety of an aircraft during flight time. Flight time is defined as the time from the moment the aircraft first moves under its own power for the purpose of flight until the moment it comes to rest at the next point of landing.*

If your inquiry concerns taxiing an aircraft for the purpose of flight, the student pilot may not act as pilot in command with a passenger aboard. However, this activity by the student pilot is not prohibited if the taxiing of the aircraft is not for the purpose of flight.

● Safety Pilot Requirements

The *Federal Air Regulations* state that "aircraft shall not be flown under simulated instrument flight conditions unless. . . . an appropriately rated pilot occupies the other control seat as a safety pilot. . . ." My question is this: Is a student pilot an appropriately rated pilot?

David A. Coats
Winston-Salem, N. C.

"Appropriately rated pilot" as used in section 91.21 (b) of Part 91 (new) of the FAR, means a person who is qualified to operate the aircraft under conditions as they exist for him during the flight. Since the safety pilot may at any time be obliged to take over control of the aircraft to avoid other traffic or to recover from incipiently hazardous attitudes, he must be fully qualified to do so.

The aeronautical skill required of a student pilot is only to the degree necessary to satisfy his flight instructor that he is competent to make solo flights under normal conditions. We do not consider this limited demonstration of skill sufficient to establish that the student pilot has the judgment, experience and skill needed by a safety pilot.

Furthermore, a student pilot is not actually rated; instead, his certificate is endorsed by his flight instructor that he is able to make solo flights or solo cross-country flights.

● Oops

There is an error in the February *FAA Aviation News* in the "Safety First" article on Loads and Load Factors. When the bank angle is 80°, the load factor is 5.7587705 (which may be rounded off to 5.76) and not 4.76.

Russell W. Jones
Columbus, Ohio

Reading your Load and Load Factors story I noted an error on the 80° bank turn load factor. This should be 5.76 which is a factor one greater than you have indicated.

B. J. Ulrich, Jr.
Morgantown W. Va.

The probable cause was faulty proofreading. As both alert readers indicate, the correct factor for an 80° angle of bank should be 5.76, not 4.76.

● Expired Pilot's License

Recently, I took a second class physical and presented it with an application to reissue my Commercial Pilot's License which I received in the Air Force in 1945. I thought it had an indefinite term. To my dismay, I found out that a directive had been issued making my license invalid.

Is it possible in any manner to extend the ruling and re-issue my license?

Clifton J. Heathcote
Gibsonia, Pa.

An amendment to the Civil Air Regulations, *Part 20, provided for the expiration of all pilot certificates issued between January 1, 1942, and July 1, 1945, and the exchange of these certificates at any time prior to July 1, 1947 without any further showing of competence. This section was amended in 1947 extending the exchange privilege indefinitely.*

As ample time had been allowed for the exchange of those certificates which expired in 1947, that section was deleted from the revision of CAR, Part 20, effective August 23, 1956, and none of these certificates can be exchanged after the effective date of this revision.

You may, however, be issued a Commercial Pilot Certificate in the same manner as for any rated former military pilot who has been discharged or relieved from active duty for more than 12 months by successfully passing the written and the flight test requirement.

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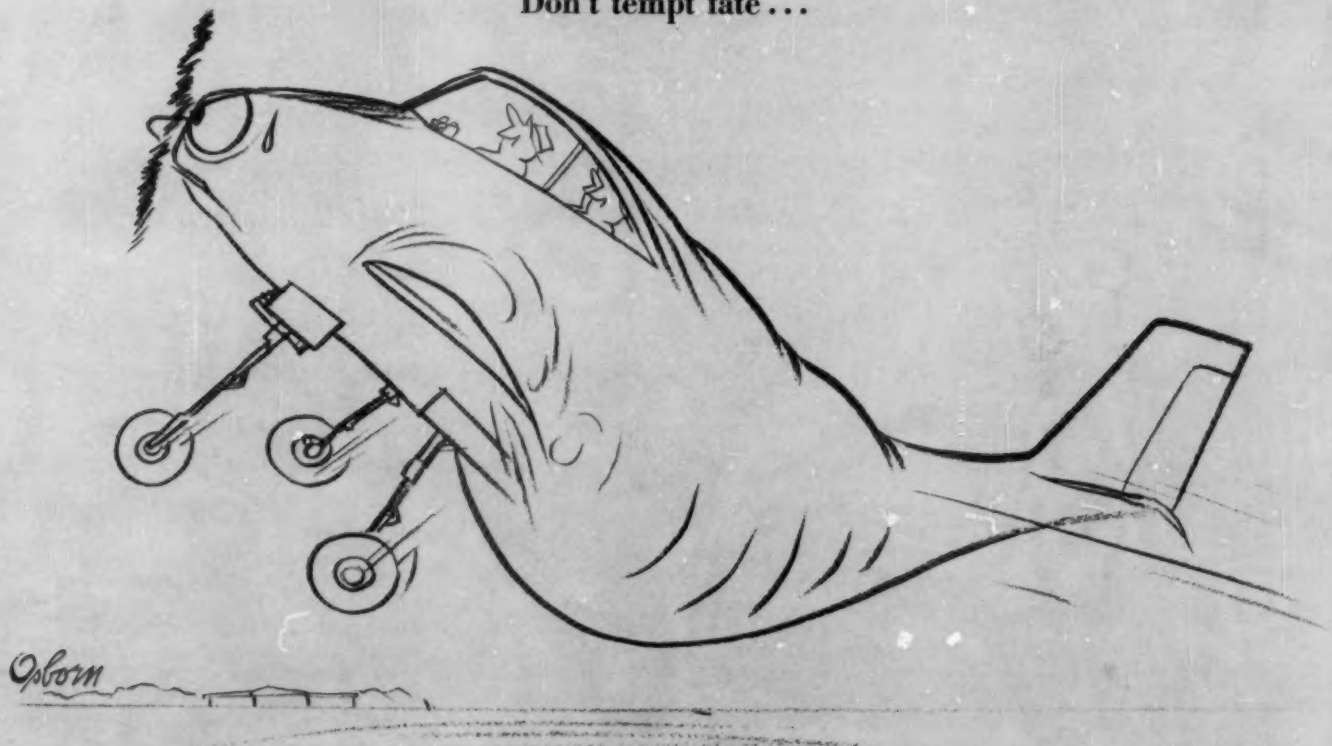

Check your weight!